

CLAIMS

What is claimed is:

1. An expression vector comprising the nucleic acid sequence as illustrated in SEQ ID NO.: 5 or
5 Figure 4; a nucleic acid sequence encoding the amino acid sequence illustrated in SEQ ID NO.: 6 or Figure 5; or a fragment thereof.
2. The expression vector of claim 1 wherein the vector is a plasmid or a viral vector.
3. The expression vector of claim 2 wherein the viral vector is selected from the group consisting of poxvirus, adenovirus, retrovirus, herpesvirus, and adeno-associated virus.
- 10 4. The expression vector of claim 3 wherein the viral vector is a poxvirus selected from the group consisting of vaccinia, NYVAC, avipox, canarypox, ALVAC, ALVAC(2), fowlpox, and TROVAC.
5. The expression vector of claim 4 wherein the viral vector is a poxvirus selected from the group consisting of NYVAC, ALVAC, and ALVAC(2).
- 15 6. The expression vector of claim 1 further comprising at least one additional tumor-associated antigen.
7. The expression vector of claim 6 wherein the vector is a plasmid or a viral vector.
8. The expression vector of claim 7 wherein the viral vector is selected from the group consisting of poxvirus, adenovirus, retrovirus, herpesvirus, and adeno-associated virus.
- 20 9. The expression vector of claim 8 wherein the viral vector is a poxvirus selected from the group consisting of vaccinia, NYVAC, avipox, canarypox, ALVAC, ALVAC(2), fowlpox, and TROVAC.
10. The expression vector of claim 9 wherein the viral vector is a poxvirus selected from the group consisting of NYVAC, ALVAC, and ALVAC(2).
- 25 11. The expression vector of claim 1 further comprising at least one nucleic sequence encoding an angiogenesis-associated antigen.
12. The expression vector of claim 11 wherein the vector is a plasmid or a viral vector.
13. The expression vector of claim 12 wherein the viral vector is selected from the group consisting of poxvirus, adenovirus, retrovirus, herpesvirus, and adeno-associated virus.
- 30 14. The expression vector of claim 13 wherein the viral vector is a poxvirus selected from the group consisting of vaccinia, NYVAC, avipox, canarypox, ALVAC, ALVAC(2), fowlpox, and TROVAC.
15. The expression vector of claim 14 wherein the viral vector is a poxvirus selected from the group consisting of NYVAC, ALVAC, and ALVAC(2).

16. The expression vector of claim 6 further comprising at least one nucleic sequence encoding an angiogenesis-associated antigen.
17. The expression vector of claim 16 wherein the vector is a plasmid or a viral vector.
18. The expression vector of claim 17 wherein the viral vector is selected from the group consisting of poxvirus, adenovirus, retrovirus, herpesvirus, and adeno-associated virus.
19. The expression vector of claim 17 wherein the viral vector is a poxvirus selected from the group consisting of vaccinia, NYVAC, avipox, canarypox, ALVAC, ALVAC(2), fowlpox, and TROVAC.
20. The expression vector of claim 18 wherein the viral vector is a poxvirus selected from the group consisting of NYVAC, ALVAC, and ALVAC(2).
21. An expression vector selected from the group consisting of an expression vector of claim 1, an expression vector of claim 6, an expression vector of claim 11, and an expression vector of claim 16; further comprising a nucleic acid sequence encoding a co-stimulatory molecule.
22. The expression vector of claim 22 wherein the vector is a plasmid or a viral vector.
23. The expression vector of claim 23 wherein the viral vector is selected from the group consisting of poxvirus, adenovirus, retrovirus, herpesvirus, and adeno-associated virus.
24. The expression vector of claim 24 wherein the viral vector is a poxvirus selected from the group consisting of vaccinia, NYVAC, avipox, canarypox, ALVAC, ALVAC(2), fowlpox, and TROVAC.
25. The expression vector of claim 18 wherein the viral vector is a poxvirus selected from the group consisting of NYVAC, ALVAC, and ALVAC(2).
26. A composition comprising an expression vector in a pharmaceutically acceptable carrier, said vector comprising the nucleic acid sequence shown in SEQ ID NO.:5 or Figure 4; a nucleic acid sequence encoding the amino acid sequence illustrated in SEQ ID NO.: 6 or Figure 5; or a fragment thereof.
27. The composition of claim 26 wherein the vector is a plasmid or a viral vector.
28. The composition of claim 27 wherein the viral vector is selected from the group consisting of poxvirus, adenovirus, retrovirus, herpesvirus, and adeno-associated virus.
29. The composition of claim 28 wherein the viral vector is a poxvirus selected from the group consisting of vaccinia, NYVAC, avipox, canarypox, ALVAC, ALVAC(2), fowlpox, and TROVAC.
30. The composition of claim 29 wherein the viral vector is a poxvirus selected from the group consisting of NYVAC, ALVAC, and ALVAC(2).

31. A method for preventing or treating cancer comprising administering to a host an expression vector comprising the nucleic acid sequence illustrated in SEQ ID NO.: 5 or Figure 4; a nucleic acid encoding the amino acid sequence illustrated in SEQ ID NO.: 6 or Figure 5; or a fragment thereof.
- 5 32. The method of claim 31 wherein the vector is a plasmid or a viral vector.
33. The method of claim 32 wherein the viral vector is selected from the group consisting of poxvirus, adenovirus, retrovirus, herpesvirus, and adeno-associated virus.
34. The method of claim 33 wherein the viral vector is a poxvirus selected from the group consisting of vaccinia, NYVAC, avipox, canarypox, ALVAC, ALVAC(2), fowlpox, and
- 10 TROVAC.
35. The method of claim 34 wherein the viral vector is a poxvirus selected from the group consisting of NYVAC, ALVAC, and ALVAC(2).
36. An isolated peptide derived from BFA5 as shown in Table X or XI.
37. A method for immunizing a host against the tumor antigen BFA5 comprising administering to
- 15 the patient a peptide shown in Table X or XI, either alone or in combination with another agent, where the individual components of the combination are administered simultaneously or separately from one another.
38. An isolated peptide derived from BFA5 as shown in Table X or XI.
39. A method for immunizing a host against the tumor antigen BFA5 comprising administering to
- 20 the patient a peptide shown in Table X or XI, either alone or in combination with another agent, where the individual components of the combination are administered simultaneously or separately from one another.
40. The expression vector of claim 6 wherein the additional tumor-associated antigen is encoded by a nucleic acid sequence selected from the group consisting of SEQ ID NO.: 1; SEQ ID
- 25 NO.: 3; the nucleic acid sequence shown in Figure 1; the nucleic sequence illustrated in Figure 3A; a nucleic acid sequence encoding the amino acid sequence of SEQ ID NO.: 2; a nucleic acid sequence encoding the amino acid sequence of SEQ ID NO.: 4; the nucleic acid sequence encoding the amino acid sequence illustrated in Figure 2; a nucleic acid sequence encoding the amino acid sequence illustrated in Figure 3B; a nucleic acid hybridizable under
- 30 stringent conditions to any of the foregoing sequences; a fragment of any of the foregoing nucleic acid sequences; and, a derivative of any of the foregoing nucleic acid sequences.
41. The expression vector of claim 40 wherein the viral vector is selected from the group consisting of poxvirus, adenovirus, retrovirus, herpesvirus, and adeno-associated virus.

42. The expression vector of claim 41 wherein the viral vector is a poxvirus selected from the group consisting of vaccinia, NYVAC, avipox, canarypox, ALVAC, ALVAC(2), fowlpox, and TROVAC.
43. The expression vector of claim 42 wherein the viral vector is a poxvirus selected from the group consisting of NYVAC, ALVAC, and ALVAC(2).
44. An expression vector selected from the group consisting of an expression vector of claim 40, an expression vector of claim 41, an expression vector of claim 42, and an expression vector of claim 42; further comprising a nucleic acid sequence encoding a co-stimulatory molecule.
45. An expression vector of claim 44 or claim 21 wherein the co-stimulatory molecule is human B7.1 or a derivative thereof.
46. A composition comprising an expression vector of claim 40 in a pharmaceutically acceptable carrier.
47. A composition comprising an expression vector of claim 41 in a pharmaceutically acceptable carrier.
48. A composition comprising an expression vector of claim 42 in a pharmaceutically acceptable carrier.
49. A composition comprising an expression vector of claim 43 in a pharmaceutically acceptable carrier.
50. A composition comprising an expression vector of claim 44 in a pharmaceutically acceptable carrier.
51. A composition comprising an expression vector of claim 45 in a pharmaceutically acceptable carrier.
52. A method for preventing or treating cancer comprising administering to a host a composition of claim 46.
53. A method for preventing or treating cancer comprising administering to a host a composition of claim 47.
54. A method for preventing or treating cancer comprising administering to a host a composition of claim 48.
55. A method for preventing or treating cancer comprising administering to a host a composition of claim 49.
56. A method for preventing or treating cancer comprising administering to a host a composition of claim 50.

57. A method for preventing or treating cancer comprising administering to a host a composition of claim 51.
58. An isolated DNA molecule comprising the nucleic acid of SEQ ID NO.:5 and at least one of the nucleic acid sequences of SEQ ID NO.: 3 or SEQ ID NO.: 5.
- 5 59. An expression vector comprising the isolated DNA molecule of claim 58.
60. An isolated DNA molecule comprising a nucleic acid encoding the amino acid sequence of SEQ ID NO. 6 and at least one of the amino acid sequences of SEQ ID NO.: 2 or SEQ ID NO.: 4.
61. An expression vector comprising the isolated DNA molecule of claim 60.
- 10 62. An isolated DNA molecule comprising the nucleic acid of SEQ ID NO.:5 and at least one of the nucleic acid sequences of SEQ ID NO.: 3 or SEQ ID NO.: 5; a nucleic acid hybridizable under stringent conditions to the nucleic acid sequences of SEQ ID NO.: 3 or SEQ ID NO.: 5; a fragment of the nucleic acid sequences of SEQ ID NO.: 3 or SEQ ID NO.: 5; and, a derivative of any of the nucleic acid sequences of SEQ ID NO.: 3 or SEQ ID NO.: 5.
- 15 63. An antibody having the ability to bind the amino acid sequence of SEQ ID NO.: 6 or a fragment the amino acid sequence of SEQ ID NO.: 6.